SANYO

SANYO
STEREO TUNER
FMT 1001K
SERVICE MANUAL

SPECIFICATIONS

FM SECTION

Tuning Frequency Range		88 MHz to 108 MHz
Usable Sensitivity (IHF)		2.5 μV
IF Rejection (98 MHz)		90 dB
Image Rejection (98 MHz)		56 dB
AM Suppression		50 dB
Capture Ratio		1.0 dB
Selectivity (IHF)		45 dB
Signal-to-Noise Ratio		70 dB
Harmonic Distortion(100% mod.)	Mono	0.2 %
	Stereo	0.4 %
Stereo Separation (at 1 kHz)		40 dB

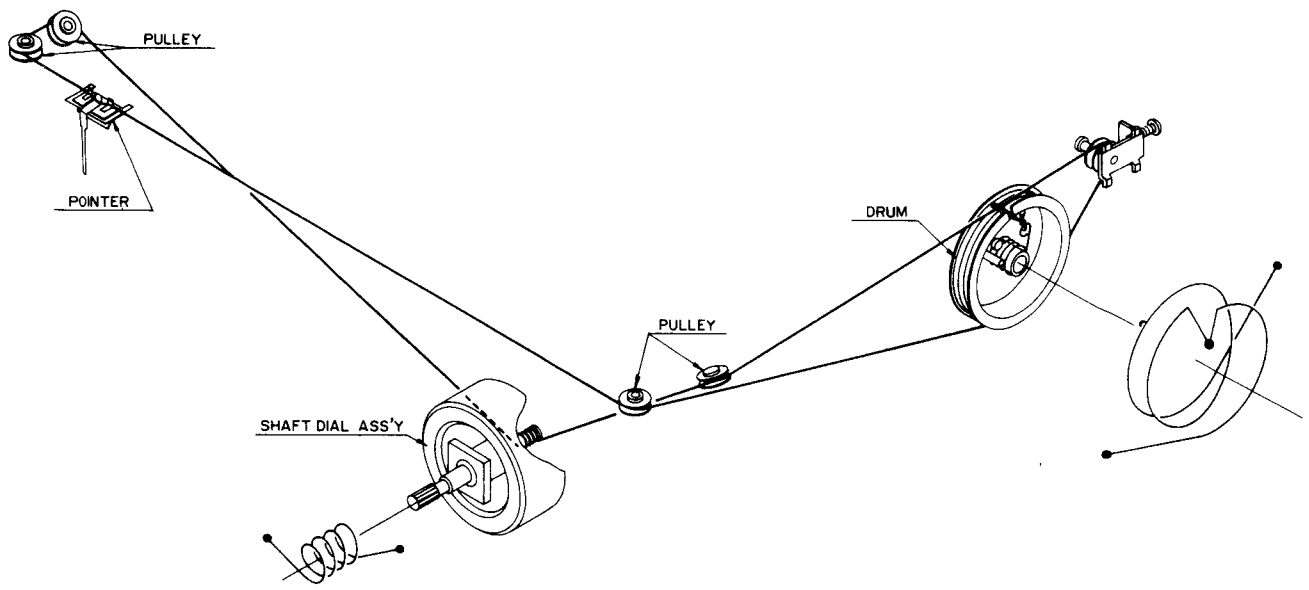
AM SECTION

Tuning Frequency Range	535kHz to 1,605kHz
Usable Sensitivity(at 20dB Quieting)	300 μV/m
Image Rejection	48 dB
IF Rejection	42 dB
Selectivity (IHF)	43 dB
Signal-to-Noise Ratio	65 dB
Harmonis Distortion(100kμV/m,30% mod.)	0.3 %

GENERAL SECTION

Output (Level/Impedance)	500mV/3k ohm
Power Source	110/120/220/240V, 50Hz/60Hz
Power Consumption	10 W
Dimensions	(W)400x(H)148x(D)355mm 15-3/4"x5-5/32"x14"
Weight	6.1kg(13 lds, 8 ozs.)

DIAL CORD STRING



AM-FM RF/IF AMP/MPX ADJUSTMENT

AM ADJUSTMENT

Step	Adjusting circuit	Connection		SG. frequency	Position of tuning dial	Adjustment	V.T.V.M. Oscilloscope
		Input	Output				
1	IF	Connect sweep generator to VC4.	Connect oscilloscope to test point TP 19	455 KHz	Near max. capacity of VC at position with no signal.	AM 1st 9-21310 AM DET 9-21291	455 KHz
2	RF	Connect standard loop antenna to output terminal of SG. Place receiver 2 feet from loop antenna	Connect V.T.V.M. to TP 19	600 KHz (400Hz. 30 % modulation)	600 KHz	AM ANT 9-21084 AM OSC 9-20851	Max.
3				1400 KHz (400Hz, 30 % modulation)	1400 KHz	TC4 TC5	Max.
4	Repeat adjustments.						

PREPARE
1. Variable capacitor completely closed.
2. Set the dial pointer to very left line dial scale.
3. Connect sweep generator, SG, V.T.V.M. and oscilloscope.
4. Function switch to "AM."
5. Use a screwdriver with plastic grip for all adjustments.

FM ADJUSTMENT

Step	Adjusting circuit	Connection		SG.frequency	Position of tuning dial	Adjustment	V.T.V.M. Oscilloscope
		Input	Output				
1	IF	Connect sweep generator to test point TP VC2 through 0.01 μF	Connect oscilloscope to test point TP 7	10.7 MHz (none modulation)	Near max.capacity of VC. at position with no signal.	IFT In FRONT END	10.7MHz
2	Ratio Det.		Connect oscilloscope to test point TP 6			FM QUADRATURE COIL. 9-21320	
3	RF	Connect FM SG. to FM ANT terminals.	Connect V.T.V.M. to speaker terminal.	90 MHz (400 Hz, 30 % modulation)	90 MHz	LA LR	Max.
4				106 MHz (400 Hz, 30 % modulation)	106 MHz	TCA TCR	Max.
5	Repeat adjustments.						

PREPARE
1. Variable capacitor completely closed.
2. Set the dial pointer to very left line of dial scale.
3. Connect sweep generator, FM SG, V.T.V.M. and oscilloscope. FM ANT input impedance is 300 ohm.
4. Function switch to "FM."
5. Use a screwdriver with plastic grip for all adjustments.

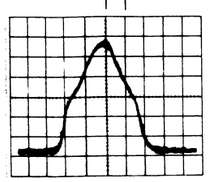
FM MPX ADJUSTMENT

Step	Adjusting circuit	Connection		Position of tuning dial	Adjustment	
		Input	Output			
1	PLL IC FO (19 KHz) Adjustment	None	Connect Frequency counter or synchroscope to TP 8	Near max. capacity of VC. at position with no signal.	Adjust VR 01 (5K-B) so that 19 KHz may be indicated on the frequency counter or synchroscope.	
2	FM STEREO Signal Separation	Connect FM stereo SG to FM ANT terminals. 19 KHz signal ON. Main channel, sub channel signal ON. Add 1000 Hz signal from L Ch.	Connect V.T.V.M. to output terminal (R channel).		VR 02 (1K-B)	V.T.V.M. Min.
		Connect FM stereo SG to FM ANT terminals. 19 KHz signal ON. Main channel, sub channel signal ON. Add 1000 Hz signal from R Ch.	Connect V.T.V.M. to output terminal (L channel)			
3	Repeat steps 1, 2, Set at position with max. channel separation.					

PREPARE
1. Variable capacitor completely closed.
2. Connect FM stereo SG and V.T.V.M.
3. Function switch to "FM"
4. Use a screwdriver with plastic grip for all adjustments.

ALIGNMENT WAVE FORMS

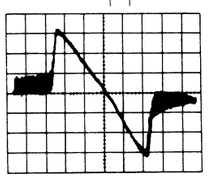
FM IF CURVE



Connect 10.7MHz Sweep Generator to TP6, ground to pin12.
Markers are not requied.
Set Generator output at 70dB.
Set Vertical Sensitivity 0.1V/cm.
Horizontal Sweep 3ms/cm.

IF FREQ
FM IF ALIGNMENT

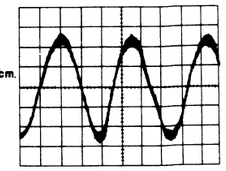
S-CURVE



Connect 10.7 MHz Sweep Generator to TP6, ground to pin12.
Generator output at 70dB.
Set Vertical Sensitivity 0.2V/cm.
Horizontal Sweep 3ms/cm.

FM DETECTOR ALIGNMENT

SINE WAVE



SYMMETRICAL TUNING

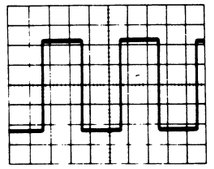
AM FRONT END ALIGNMENT

AM Generator to EXT AM ANT and GND terminals, open GND link.
Set to 600KHz.
Modulate with 400Hz, 30% modulation.
Front panel field streugth meter.
Then set to 1400KHz by dbob way.

FM FRONT END ALIGNMENT

Connect FM Generator to FM ANTenna terminals through 300 ohm Dummy.
Set to 88MHz.
Field strength meter and center of channel meter on front panel.
Set to 108 MHz.

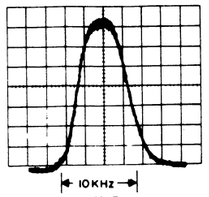
SQUARE WAVE



Scope vertical input to TP8.
Vertical out put to 1V/cm.

MPX F.F.C ADJUSTMENT

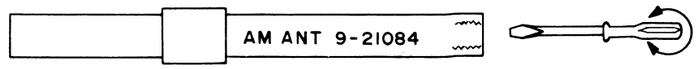
AM IF CURVE

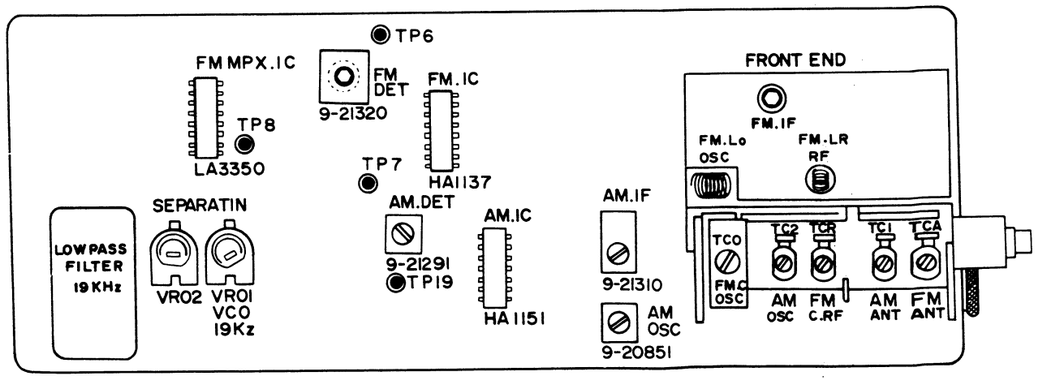


455KHz Sweep Generator to TP19, ground to pin12.
Use 0.1uF capacitor in series with generator lead.
Generator out put at 50dB.
Set Vertical Sensitivity 0.1V/cm.
Horizontal Sweep 3m/cm.

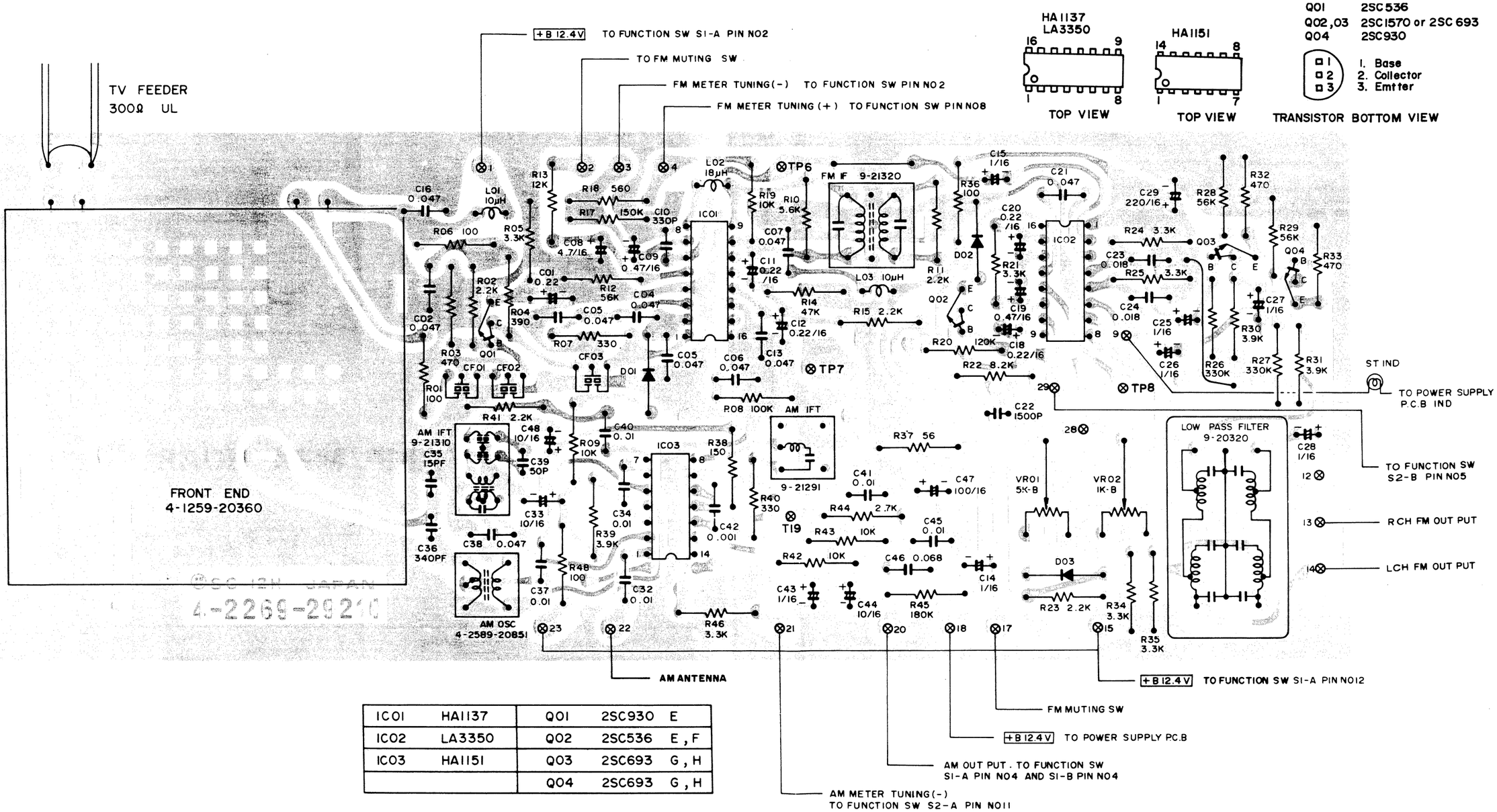
AM IF ALIGNMENT

AM-FM RF/IF AMP/MPX BOARD LAYOUT





AM-FM RF/IF AMP MPX P.C.BOARD



IC01	HA1137	Q01	2SC930	E
IC02	LA3350	Q02	2SC536	E, F
IC03	HA1151	Q03	2SC693	G, H
		Q04	2SC693	G, H

BOTTOM VIEW

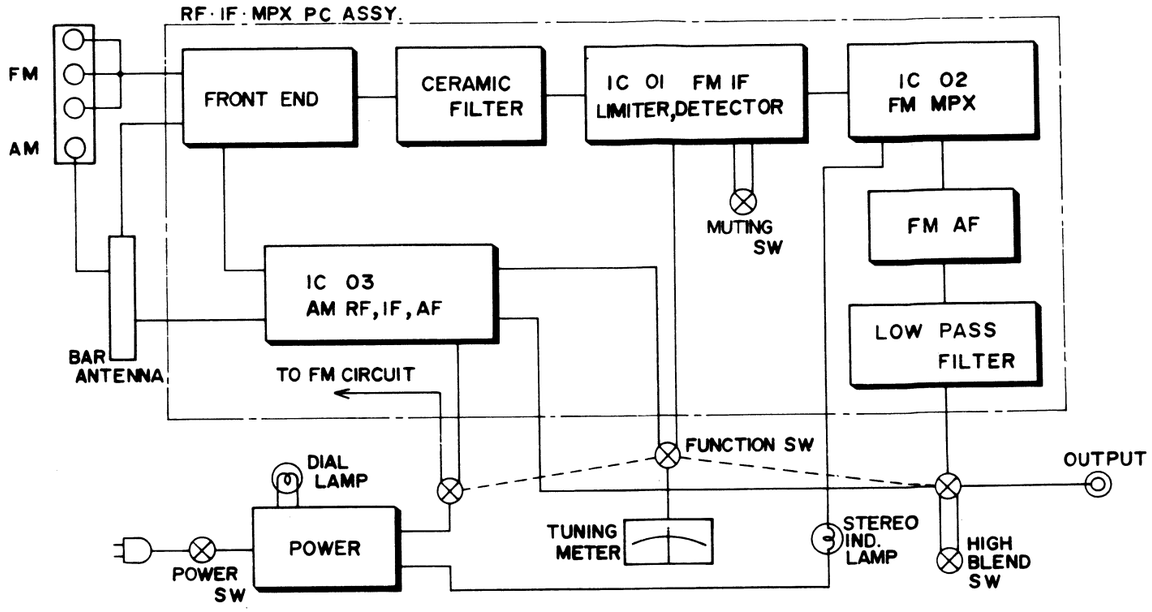
PARTS LIST

Key No.	Part No.	Description	Q'ty
	AM-FM RF/IF MPX PCB ASSY		
	131 0 4001 73301	RF IF MPX PC Assy	1
	4 1259 20360	Front End	1
	4 2229 22842	VR 5k-B	1
	4 2229 24210	VR 1k-B	1
	4 2279 20320	Low Pass Filter	1
	4 2539 20370	10 μH	1
	4 2539 20380	18 μH	1
	4 2539 20390	Choke Coil 1 μH	1
	4 2569 21291	IF Trans AM	1
	4 2569 21310	IF Trans AM	1
A01	4 2569 21320	IF Trans FM	1
A02	4 2569 21350	IF Trans FM	1
	4 2589 20851	OSC Coil AM	1
	365 3 0300 80000	Feeder 300 ohm	1
CF01,03 02	4 2279 20240	Ceramic Filter	3
	CAPACITORS		
C01	C1CUEX224A	Alsicon 0.22μF 16V +40 –20%	1
C02,03 04,05 06,07	C1HYSZ473A	Ceramic 0.047μF 50V +80 –20%	6
C08	C1CRE-475A	Electrolytic 4.7μF 16V	1
C09	C1CUEX474A	Alsicon 0.47μF 16V +40 –20%	1
C10	C1HCSK331SL	Ceramic 330pF 50V±10%	1
C11,12	C1CUEX224A	Alsicon 0.22μF 16V +40 –20%	2
C13	C1HYSZ473A	Ceramic 0.047μF 50V +80 –20%	2
C14,15	C1CUEX105A	Alsicon 1μF 16V +40 –20%	2
C16	C1HYSZ473A	Ceramic 0.047μF 50V +80 –20%	1
C18	C1CUEX224A	Alsicon 0.22μF 16V +40 –20%	1
C19	C1CUEX474A	Alsicon 0.47μF 16V +40 –20%	1
C20	C1CUEX224A	Alsicon 0.22μF 16V +40 –20%	1
C21	C1HFRM473A	Mylar 0.047μF 50V ±20%	1
C22	C1HSEJ152A	Styrol 1500pF 35V ±5%	1
C23,24	C1HFRK183A	Mylar 0.018μF 50V ±10%	2
C25,26 27,28	C1CUEX105A	Alsicon 1μF 16V +40 –20%	4
C29	C1CRE-227A	Electrolytic 220μF 16V	1
C32	C1HFRM103A	Mylar 0.01μF 50V ±20%	1
C33	C1CRE-106A	Electrolytic 10μF 16V	1
C34	C1HFRM103A	Mylar 0.01μF 50V ±20%	1
C35	C1HCSJ150WK	Ceramic 15pF 50V ±5%	1
C36	C1HSEJ341A	Styrol 340pF 50V ±5%	1
C37	C1HFRM103A	Mylar 0.01μF 50V ±20%	1
C38	C1HYSZ473A	Ceramic 0.047μF 50V +80 –20%	1
C39	C1HCSK500SL	Ceramic 50pF 50V ±10%	1
C40,41	C1HFRM103A	Mylar 0.01μF 50V ±20%	2
C42	C1HYSZ102A	Ceramic 0.001μF 50V +80 –20%	1
C43	C1CUEX105A	Alsicon 1μF 16V +40 –20%	1
C44	C1CRE-106A	Electrolytic 10μF 16V	1
C45	C1HFRM103A	Mylar 0.01μF 50V ±20%	1
C46	C1HFRM683A	Mylar 0.068μF 50V ±20%	1
C47	C1CRE-107A	Electrolytic 100μF 16V	1
C48	C1CRE-106A	Electrolytic 10μF 16V	1
	SEMICONDUCTORS		
D01,02 D03	205 5 9040 44210	DS-442	3
IC01	IKK-HA1137	HA 1137	1
IC02	206 5 0473 35010	LA 3350	1
IC03	IKK-HA1151	HA 1151	1
Q01	203 5 5500 93050	2SC 930 E	1
Q02	203 5 5100 53650	2SC 536 E,F	1
Q03,04	203 5 5120 69372	2SC693G-U,H-U	2

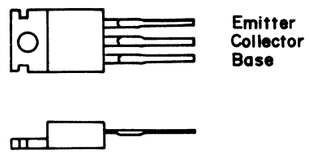
Key No.	Part No.	Description	Q'ty
	RESISTORS		
R01	R2EDSJ101A	Carbon 100 1/4W ±5%	1
R02	R2EDSJ222A	Carbon 2.2k 1/4W ±5%	1
R03	R2EDSJ471A	Carbon 470 1/4W ±5%	1
R04	R2EDSJ391A	Carbon 390 1/4W ±5%	1
R05	R2EDSJ332A	Carbon 3.3k 1/4W ±5%	1
R06	R2EDSJ101A	Carbon 100 1/4W ±5%	1
R07	R2EDSJ331A	Carbon 330 1/4W ±5%	1
R08	R2EDSJ104A	Carbon 100k 1/4W ±5%	1
R09	R2EDSJ103A	Carbon 10k 1/4W ±5%	1
R10	R2EDSJ562A	Carbon 5.6k 1/4W ±5%	1
R11	R2EDSJ222A	Carbon 2.2k 1/4W ±5%	1
R12	R2EDSJ563A	Carbon 56k 1/4W ±5%	1
R13	R2EDSJ123A	Carbon 12k 1/4W ±5%	1
R14	R2EDSJ473A	Carbon 47k 1/4W ±5%	1
R15	R2EDSJ222A	Carbon 2.2k 1/4W ±5%	1
R17	R2EDSJ154A	Carbon 150k 1/4W ±5%	1
R18	R2EDSJ561A	Carbon 560 1/4W ±5%	1
R19	R2EDSJ103A	Carbon 10k 1/4W ±5%	1
R20	R2EDSJ124A	Carbon 120k 1/4W ±5%	1
R21	R2EDSJ332A	Carbon 3.3k 1/4W ±5%	1
R22	R2EDSJ822A	Carbon 8.2k 1/4W ±5%	1
R23	R2EDSJ222A	Carbon 2.2k 1/4W ±5%	1
R24,25	R2EDSJ332A	Carbon 3.3k 1/4W ±5%	2
R26,27	R2EDSJ334A	Carbon 330k 1/4W ±5%	2
R28,29	R2EDSJ563A	Carbon 56k 1/4W ±5%	2
R30,31	R2EDSJ392A	Carbon 3.9k 1/4W ±5%	2
R32,33	R2EDSJ471A	Carbon 470 1/4W ±5%	2
R34,35	R2EDSJ332A	Carbon 3.3k 1/4W ±5%	2
R36	R2EDSJ101A	Carbon 100 1/4W ±5%	1
R37	R2EDSJ560A	Carbon 56 1/4W ±5%	1
R38	R2EDSJ151A	Carbon 150 1/4W ±5%	1
R39	R2EDSJ392A	Carbon 3.9k 1/4W ±5%	1
R40	R2EDSJ331A	Carbon 330 1/4W ±5%	1
R41	R2EDSJ222A	Carbon 2.2k 1/4W ±5%	1
R42,43	R2EDSJ103A	Carbon 10k 1/4W ±5%	2
R44	R2EDSJ272A	Carbon 2.7k 1/4W ±5%	1
R45	R2EDSJ184A	Carbon 180k 1/4W ±5%	1
R46	R2EDSJ332A	Carbon 3.3k 1/4W ±5%	1
R48	R2EDSJ101A	Carbon 100 1/4W ±5%	1
	POWER SUPPLY PCB ASSY		
	132 0 4001 70600	Power Supply PC Assy	1
	CAPACITORS		
C01,02 04	C1ERE-337A	Electrolytic 330μF 25V	3
C03	C1CRE-337A	Electrolytic 330μF 16V	1
	SEMICONDUCTORS		
D01,02 03,04	DNN-F-14K(P)	Diode	4
D05	DNN-RD13E	RD-13E	1
Q01	TNN-2SC1096-K	2SC1096K,L	1
	RESISTORS		
R01	R3AXPK390A	Metal Oxside Film 39 1W±10%	1
R02	R2EDSJ471A	Carbon 470 1/4W ±5%	1
R03	R3AXPK221A	Metal Oxside Film 220 1W±10%	1

NOTES: 1. Part orders must contain Model Number. Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

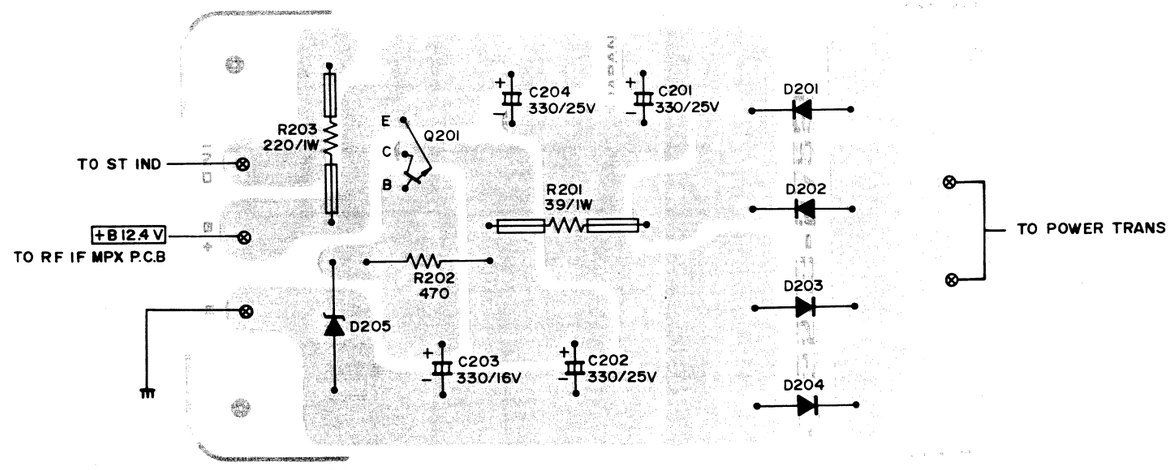
BLOCK DIAGRAM



POWER SUPPLY P.C. BOARD



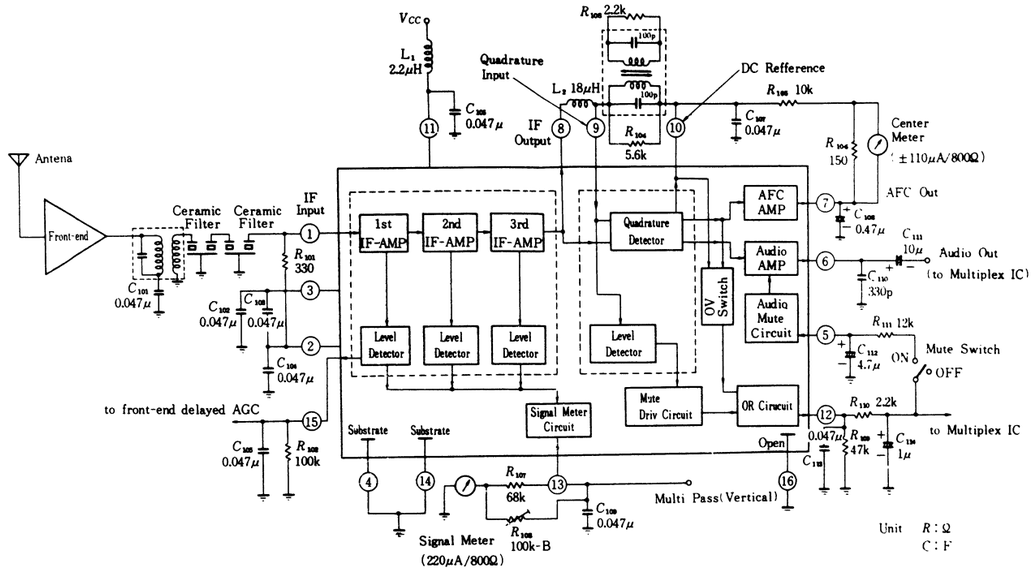
Q201 2SD325



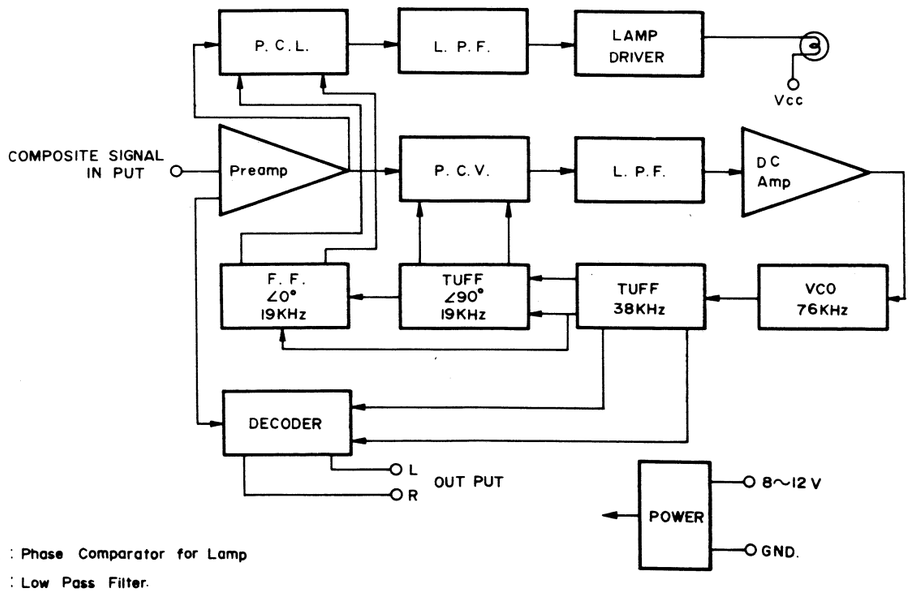
Q201 (2SC1096K/L 2SD325 D/E/F). D201 ~ 204. (F14K(P) /10D1/DS130). D205 RD13E

BOTTOM VIEW

FM IF IC HA1137 SIGNAL FLOW

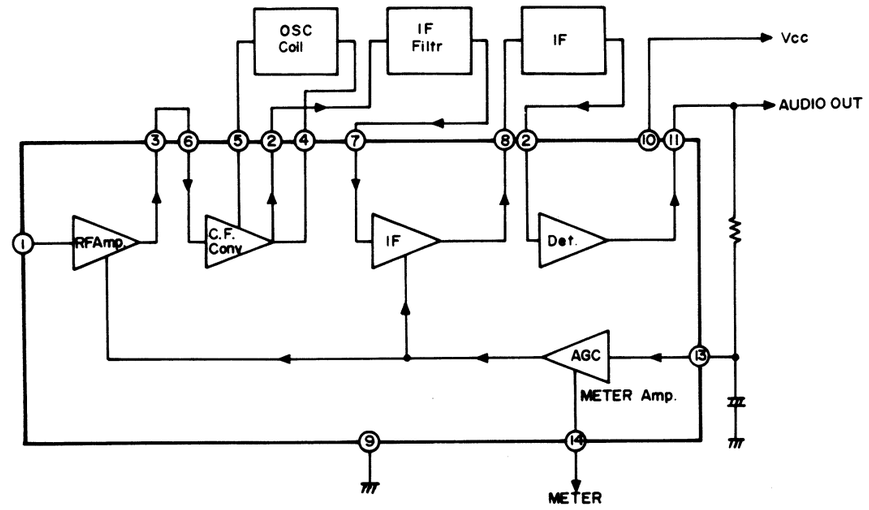


FM MPX IC LA3350 SIGNAL FLOW



P.C.L. : Phase Comparator for Lamp
L.P.F. : Low Pass Filter.
P.C.V. : Phase Comparator for VCO
VCO : Voltage Controlled Oscillator
TUFF : Direct Coupled Type Flip – flop.

AM RF IF IC HA1151 SIGNAL FLOW



PARTS LIST

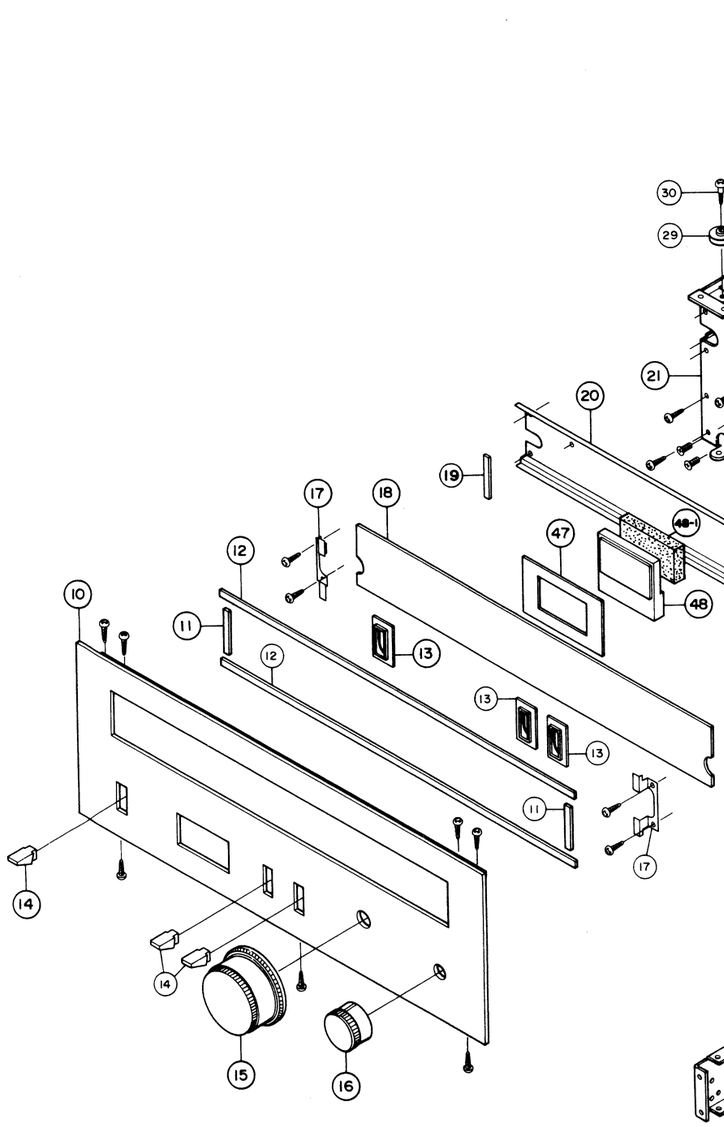
Key No.	Part No.	Description	Q'ty
PACKING			
	131 6 1139 58004	Box Corrugate Exp	1
	131 6 2119 01440	Bag Polyethylene Exp	1
	131 6 2519 02501	Bag Polyethylene Ind	1
	131 6 3009 20560	Pad	2
	131 6 3069 16050	Patching Sheet	1
ACCESSORY			
	4 2449 20230	Antenna FM	1
	131 0 4004 11501	W Pin Cord	1
	131 6 2719 10600	Bag Fan	1
	131 6 4119 54100	Explanatory Booklet	1
	131 6 4159 14700	Notes	1
CABINET			
1	131 2 1410 14400	Cover	1
2	131 2 1105 16200	Plate Bottom	1
3	131 2 1801 13200	Leg	4
	131 2 7103 19800	Label	1
	131 2 7103 19900	Caution Label	1
APPEARANCE/CHASSIS/ELECTRICAL PARTS			
10	131 2 1203 33901	Panel Control	1
11	131 2 5205 15600	Cushion	2
12	131 2 5205 15700	Cushion	2
13	131 2 1116 15000	Frame	3
14	131 2 1601 39200	Knob, Lever SW	3
15	131 0 1001 34500	Knob Assy, Tuning	1
16	131 0 1001 34600	Knob Assy, Function	1
17	131 2 6113 21900	Shelter,	2
18	131 2 1201 27701	Plate Dial	1
19	131 2 5205 16300	Cushion, Plate Dial Rear	2
20	131 2 3304 16100	Plate Dial Rear	1
21	131 2 3305 19700	Panel Front	1
21–1	131 2 3101 32000	Metal Mount	2
21–2	131 2 3614 18000	Mount Pring C Board	2
21–3	131 2 3306 21302	Panel Rear	1
22	131 2 1503 12201	Decorate Sign	1
23	131 2 6111 11601	Bushing, Stereo Ind	1
24	131 2 3406 11000	Metal Mount Ind	1
25	4 6129 20158	Pilot Lamp, ST Indicator	1
26	4 6129 20650	Pilot Lamp, Dial	3

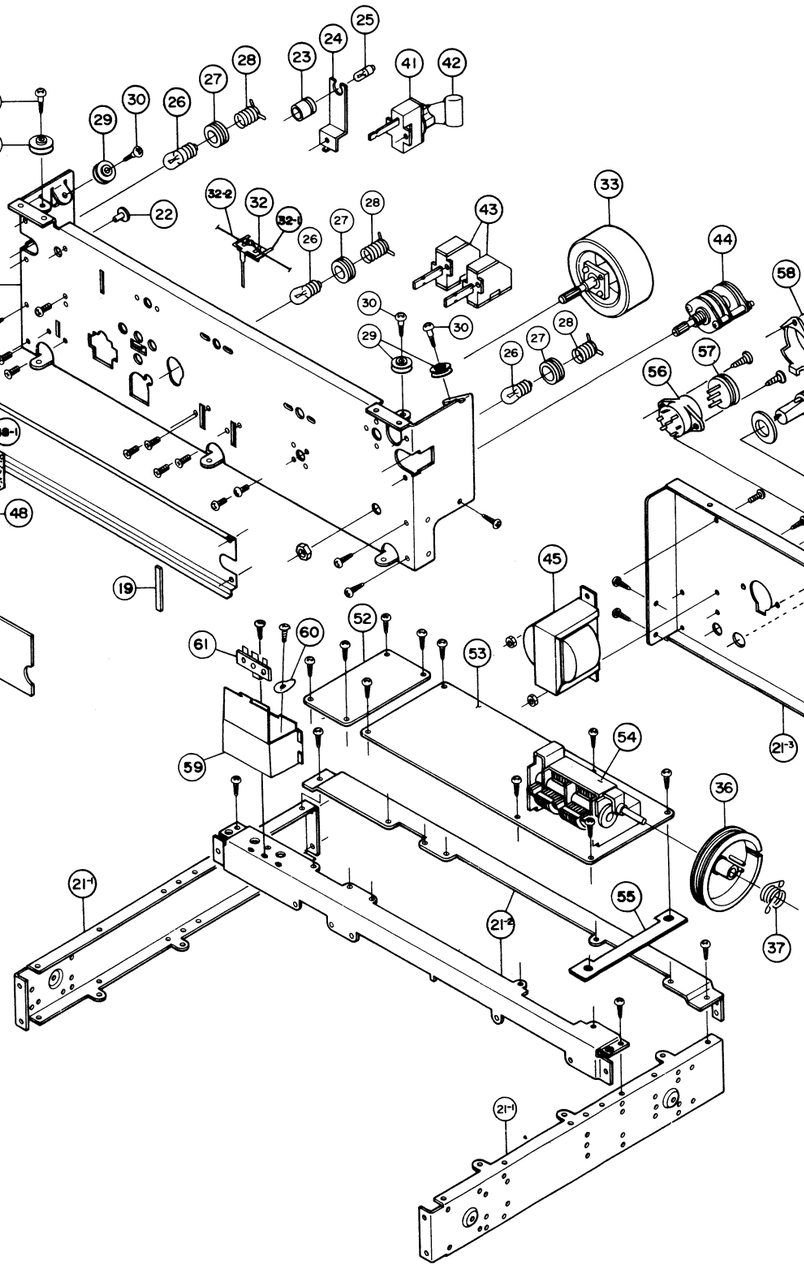
Key No.	Part No.	Description	Q'ty
27	131 2 6111 10300	Bushing, Pilot Lamp	3
28	4 2359 20970	Socket, Pilot Lamp	3
29	131 2 4107 10300	Pulley	4
30	131 2 4108 10300	Spindle Pulley	4
31	131 0 3020 05800	Pully Assy	1
32	131 0 3011 16200	Pointer Assy	1
32–1	131 2 5205 16000	Cushion	1
32–2	131 2 4112 10200	Rope 0.5	
33	131 0 3003 18600	Shaft Dial Assy	1
34	131 0 3008 11700	Support Antenna Assy	1
35	4 2579 21084	Antenna Coil MW	1
36	131 0 3002 11100	Drum Assy	1
37	131 2 4111 00400	Spring Rope	1
38	131 2 6111 14200	Bushing, Ant Lead	1
39	4 2359 21110	Fuse Holder	1
40	4 2349 20880	Fuse 0.25A	1
41	4 2319 24380	SW Lever 2P, AC Power	1
42	C2HYDP103A	Ceramic 0.01 F 500V	1
43	4 2319 24392	SW Lever 6P	2
44	4 2319 71330	SW Rotary	1
45	4 2519 23811	Power Trans	1
46	4 2359 22650	Socket Phono 2P	1
47	131 2 4208 22600	Spacer	1
48	4 5119 20550	Meter Tuning	1
48–1	131 2 5206 12800	Mold Plane	1
49	131 2 6111 14200	Bushing	1
	131 2 6111 14700	Bushing	1
50	4 2439 20390	Power Cord	1
51	4 2379 21460	Terminal 4P	1
52	131 0 4001 70600	Power Supply PC Assy	1
53	131 0 4001 73301	RF, IF, MPX, PC Assy	1
54	4 1259 20360	Front End	1
55	131 2 3202 12000	Metal Reinf	1
56	4 2359 21221	Power Select Socket	1
57	4 2369 20550	Power Select Plug	1
58	131 2 1407 10400	Cover Decorate	1
59	131 2 6108 11500	Cover Sever	1
60	4 2379 21520	Terminal Lug 1P	1
61	4 2379 20140	Terminal Lug 2P	1
62	4 2369 20270	Plug Conversion	1
63	4 2369 20260	Plug Conversion	1
	C1HFRM223A	Mylar 0.022MF 50V ±20%	1
	131 2 3608 11300	Cramp Wire	9
	131 0 3016 10500	Cramp Wire Assy	1

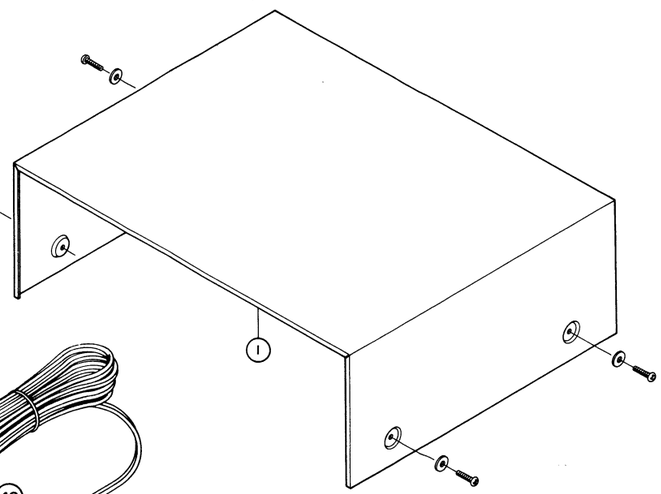
NOTES: 1. Part orders must contain Model Number. Part Number and Description.
2. Ordering quantity of screws and/or resistors must be multiple of 10 pcs.

STEREO TUNER EXPLODED VIEW

FMT 1001K

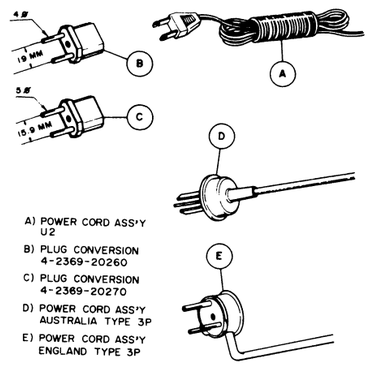






POWER CORD AND PLUG COMBINATION

1. A ONLY, 2. A+B, 3. A+C, 4. D ONLY, 5. E ONLY



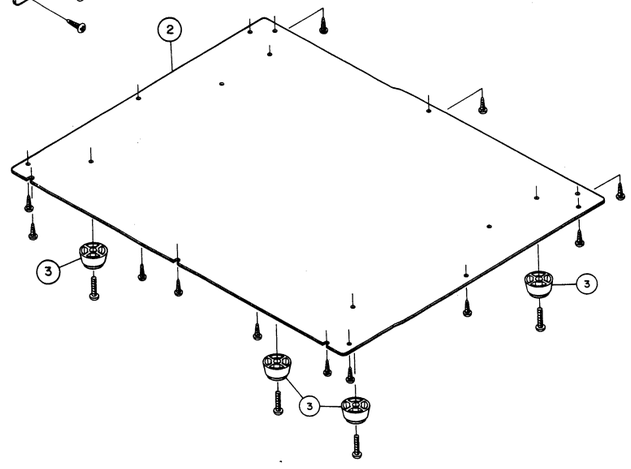
A) POWER CORD ASS'Y U2

B) PLUG CONVERSION 4-2369-20260

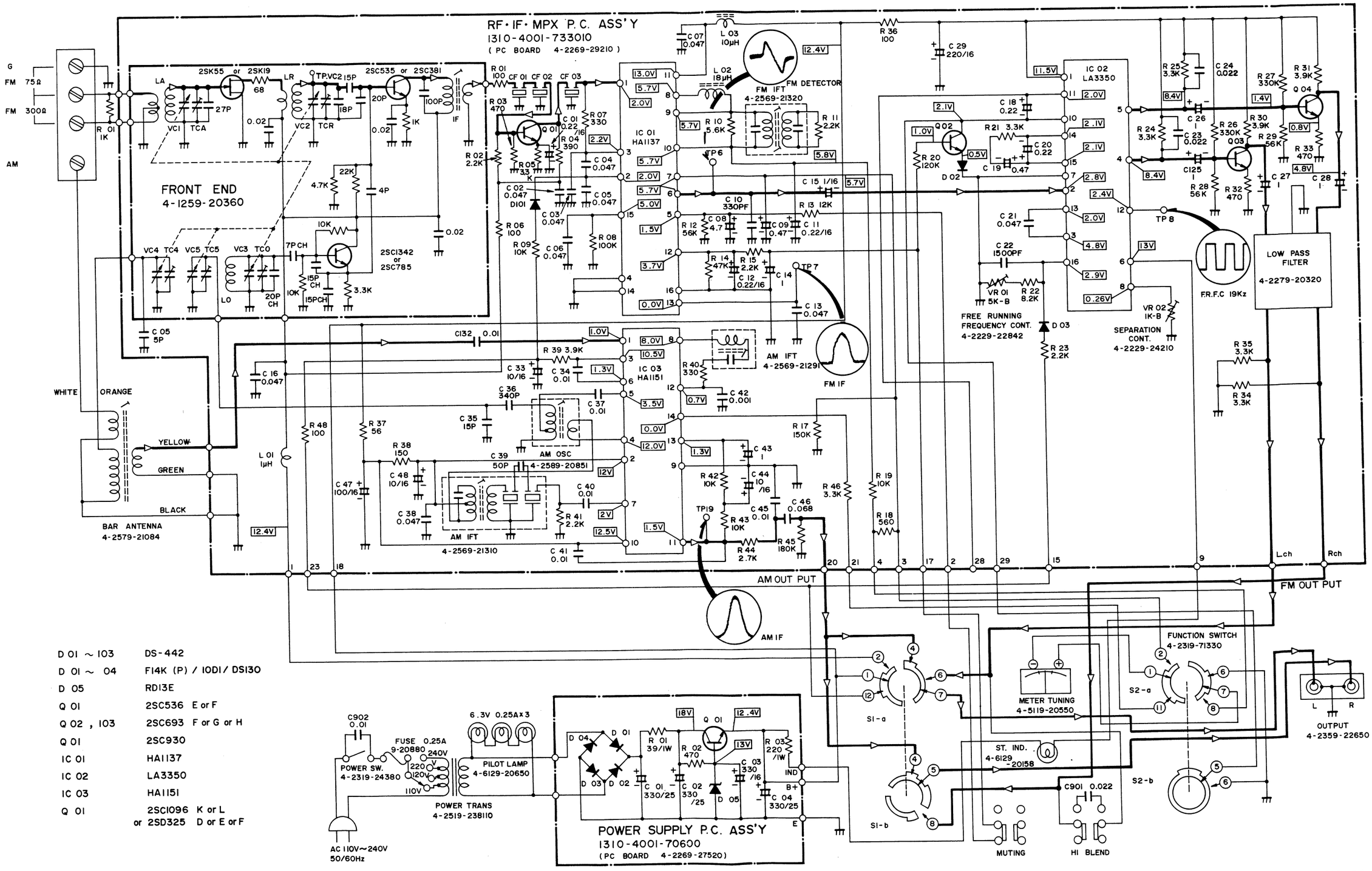
C) PLUG CONVERSION 4-2369-20270

D) POWER CORD ASS'Y AUSTRALIA TYPE 3P

E) POWER CORD ASS'Y ENGLAND TYPE 3P



STEREO TUNER SCHEMATIC DIAGRAM



D 01 ~ 103	DS-442
D 01 ~ 04	F14K (P) / 10D1 / DS130
D 05	RD13E
Q 01	2SC536 E or F
Q 02 , 103	2SC693 F or G or H
Q 01	2SC930
IC 01	HA1137
IC 02	LA3350
IC 03	HA1151
Q 01	2SC1096 K or L or 2SD325 D or E or F

SANYO ELECTRIC TRADING CO., LTD.
OSAKA, JAPAN

WM-1550 JUN/'76/2000 Printed in Japan